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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Khan *et al.*

Appl. No. 10/020,207

Filed: December 18, 2001

For: **Ball Grid Array Package
Substrates with a Modified
Central Opening and Method for
Making the Same**

Confirmation No. 7969

Art Unit: 2822

Examiner: Soward, Ida M.

Atty. Docket: 1875.1640000

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Supplemental Information Disclosure Statement

Commissioner for Patents
Washington, D.C. 20231

Sir:

Listed on accompanying Form PTO-1449 are documents that may be considered material to the examination of this application, in compliance with the duty of disclosure requirements of 37 C.F.R. §§ 1.56, 1.97 and 1.98.

Where the publication date of a listed document does not provide a month of publication, the year of publication of the listed document is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the month of publication is not in issue. Applicants have listed publication dates on the attached PTO-1449 based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not

be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

Applicants have checked the appropriate boxes below.

- 1. Statement under 37 C.F.R. 1.704(d). Each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in 37 C.F.R. § 1.56(c) more than thirty days prior to the filing of this information disclosure statement.
- 2. Filing under 37 C.F.R. § 1.97(b). This Information Disclosure Statement is being filed within three months of the date of filing of a national application other than a continued prosecution application (CPA), OR within three months of the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in an international application, OR before the mailing date of a first Office Action on the merits OR before the mailing of a first Office Action after the filing of a request for continued examination under 37 C.F.R. § 1.114. No statement or fee is required.
- 3. Filing under 37 C.F.R. § 1.97(c). This Information Disclosure Statement is being filed more than three months after the U.S. filing date AND after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection, or Notice of Allowance, or an action that otherwise closes prosecution in the application.
 - a. Statement under 37 C.F.R. § 1.97(e)(1). I hereby state that each item of information contained in this Information Disclosure Statement was

first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(1).

- b. Statement under 37 C.F.R. § 1.97(e)(2). I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).
- c. Attached is our PTO-2038 Credit Card Payment Form [OR] Check No. _____ in the amount of \$ 180.00 in payment of the fee under 37 C.F.R. § 1.17(p).
4. Filing under 37 C.F.R. § 1.97(d) This Information Disclosure Statement is being filed more than three months after the U.S. filing date and after the mailing date of a Final Rejection or Notice of Allowance, but before payment of the Issue Fee. Enclosed find our Check No. _____ in the amount of \$ _____ in payment of the fee under 37 C.F.R. § 1.17(p); in addition:
- a. Statement under 37 C.F.R. § 1.97(e)(1). I hereby state that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(1).
- b. Statement under 37 C.F.R. § 1.97(e)(2). I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more

than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).

- 5. The document(s) was/were cited in a search report by a foreign patent office in a counterpart foreign application. Submission of an English language version of the search report that indicates the degree of relevance found by the foreign office is provided in satisfaction of the requirement for a concise explanation of relevance. 1138 OG 37, 38.
- 6. A concise explanation of the relevance of the non-English language documents appears below:

Document AL1 (JP 10-189835) appears to describe a laminated semiconductor package for memory element. A copy of the English language abstract of document AL1 is enclosed as document AR1.

Document AM1 (JP 10-247703) appears to describe a ball grid array package and printed board. A copy of the English language abstract of document AM1 is enclosed as document AS1.

Document AN1 (JP 2000-286294) appears to describe a semiconductor device and its manufacture. A copy of the English language abstract of document AN1 is enclosed as document AT1.

Document AO1 (JP 10-247702) appears to describe a semiconductor package. A copy of the English language abstract of document AO1 is enclosed as document AS2.

Document AP1 (JP 10-50877) appears to describe a semiconductor package. A copy of the English language abstract of document AP1 is enclosed as document AT2.

Document AL2 (JP 11-17064) appears to describe a semiconductor package. A copy of the English language abstract of document AL2 is enclosed as document AR3.

Document AM2 (JP 11-102989) appears to describe a BGA semiconductor device. A copy of the English language abstract of document AM2 is enclosed as document AS3.

Document AN2 (JP 7-283336) appears to describe a chip carrier. A copy of the English language abstract of document AN2 is enclosed as document AT3.

Document AO2 (JP 61-49446) appears to describe a resin seal type semiconductor device. A copy of the English language abstract of document AO2 is enclosed as document AR4.

Document AP2 (JP 2001-68512) appears to describe a tab tape with stiffener and BGA package. A copy of the English language abstract of document AP2 is enclosed as document AR2.

7. Copies of the documents were cited by or submitted to the Office in an IDS that complies with 37 C.F.R. § 1.98(a)-(c) in Application No. _____, filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120. Thus, copies of these documents are not attached. 37 C.F.R. § 1.98(d).

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449, and indicate in the official file wrapper of this patent application that the documents have been considered.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Jeffrey S. Weaver
Attorney for Applicants
Registration No. 45,608

Date: 6-26-03

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Washington, D.C. 20005-3934
(202) 371-2600

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FORM PTO-1449

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENTATTY. DOCKET NO.
1875.1640000APPLICATION NO.
10/020,207APPLICANT
*Khan et al.*FILING DATE
December 18, 2001GROUP
2822U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	AA1	09/783,034	—	<i>Khan et al.</i>	—	—	02/15/2001
	AB1	09/849,537	—	<i>Zhang et al.</i>	—	—	05/07/2001
	AC1						
	AD1						
	AE1						
	AF1						
	AG1						
	AH1						
	AI1						
	AJ1						
	AK1						

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION
	AL1	10-189835	07/1998	Japan	H01L	23/24	Yes No
	AM1	10-247703	09/1998	Japan	H01L	23/12	Yes No
	AN1	2000-286294	10/2000	Japan	H01L	21/60	Yes No
	AO1	10-247702	09/1998	Japan	H01L	23/12	Yes No
	AP1	10-50877	02/1998	Japan	H01L	23/12	Yes No

OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

	AR	1	English-language Abstract of JP 10-189835, published July 21, 1998, 2 pages (last visited March 14, 2003).
	AS	1	English-language Abstract of JP 10-247703, published September 14, 1998, 1 page.
	AT	1	English-language Abstract of JP 2000-286294, published October 13, 2000, 2 pages (last visited March 14, 2003).

EXAMINER

DATE CONSIDERED

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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	AA2						
	AB2						
	AC2						
	AD2						
	AE2						
	AF2						
	AG2						
	AH2						
	AI2						
	AJ2						
	AK2						

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION
	AL2	11-17064	01/1999	Japan	H01L	23/14	Yes No
	AM2	11-102989	04/1999	Japan	H01L	23/12	Yes No
	AN2	7-283336	10/1995	Japan	H01L	23/12	Yes No
	AO2	61-49446	03/1986	Japan	H01L	23/36	Yes No
	AP2	2001-68512	03/2001	Japan	H01L	21/60	Yes No

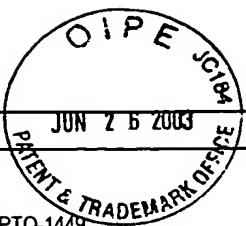
OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

AR	2	English-language Abstract of JP 2001-68512, published March 16, 2001, 1 page (last visited October 2, 2002).
AS	2	English-language Abstract of JP 10-247702, published September 14, 1998, 2 pages (last visited January 25, 2002).
AT	2	English-language Abstract of JP 10-50877, published February 20, 1998, 1 page (last visited October 2, 2002).

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JUN 26 2003

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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	AA3						
	AB3						
	AC3						
	AD3						
	AE3						
	AF3						
	AG3						
	AH3						
	AI3						
	AJ3						
	AK3						

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION
	AL3						Yes No
	AM3						Yes No
	AN3						Yes No
	AO3						Yes No
	AP3						Yes No

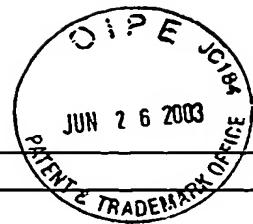
OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

AR	3	English-language Abstract of JP 11-17064, published January 22, 1999, 1 page.				
AS	3	English-language Abstract of JP 11-102989, published April 13, 1999, 1 page.				
AT	3	English-language Abstract of JP 7-283336, published October 27, 1995, 1 page.				

EXAMINER

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		APPLICANT Khan et al.	
		FILING DATE December 18, 2001	GROUP 2822

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	AA4						
	AB4						
	AC4						
	AD4						
	AE4						
	AF4						
	AG4						
	AH4						
	AI4						
	AJ4						
	AK4						

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION
	AL4						Yes No
	AM4						Yes No
	AN4						Yes No
	AO4						Yes No
	AP4						Yes No

OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

AR	4	English-language Abstract of JP 61-49446, published March 11, 1986, 1 page.				
AS	4	Kamezos, M., "An EPBGA Alternative," <i>Advanced Packaging</i> , June 1998, pages 90, 92, 94, and 96.				
AT	4	Zhao, Z., Ph.D., "Thermal Design and Modeling of Packages," <i>IEEE Short Courses</i> , Broadcom Corporation, October 25, 2000, 95 pages.				

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		APPLICANT <i>Khan et al.</i>		
		FILING DATE December 18, 2001	GROUP 2822	

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	AA5						
	AB5						
	AC5						
	AD5						
	AE5						
	AF5						
	AG5						
	AH5						
	AI5						
	AJ5						
	AK5						

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION
	AL5						Yes No
	AM5						Yes No
	AN5						Yes No
	AO5						Yes No
	AP5						Yes No

OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

AR	5	Zhao, Z., Ph.D., "IC Package Thermal Issues and Thermal Design," ASAT, Inc., January 15, 2000, 98 pages, presented at 2 nd International Icepak User's Group Meeting, Palo Alto, CA, on February 7, 2000.
AS	5	Schueler, R.D. et al., "Performance and Reliability of a Cavity Down Tape BGA Package," <i>IEEE Electronic Packaging Technology Conference</i> , 1997, pages 151-162.
AT	5	

EXAMINER	DATE CONSIDERED
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